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01633 814444;# 3/10

Patents Form 1/77

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THE PATENT OFFICE

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**Request for grant of a patent***(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)*

The Patent Office

Cardiff Road

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**1. Your reference**

P20686/CPA/RMC

**2. Patent application number***(The Patent Office will fill in this part)***3. Full name, address and postcode of the or of each applicant (underline all surnames)**Kiotech Limited  
22 Melton Street  
LONDON NW1 2BWPatents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

UK 0729 6932001

**4. Title of the invention**

"Pheromone Composition"

**5. Name of your agent (if you have one)**"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*Murgitroyd & Company  
373 Scotland Street  
GLASGOW  
G5 8QAPatents ADP number *(if you know it)*

1198013 ✓

**6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number**

Country

Priority application number  
*(if you know it)*Date of filing  
*(day / month / year)***7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application**

Number of earlier application

Date of filing  
*(day / month / year)***8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:**

Yes

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d))

**Patents Form 1/77**

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Description

6

Claim(s)

Abstract

Drawing(s)

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature Murgitroyd & Co . Date 1/10/97  
Murgitroyd & Company

12. Name and daytime telephone number of person to contact in the United Kingdom

Roisin McNally, 0141 307 8400

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1 PHEROMONE COMPOSITION

2  
3 The invention relates to compositions formulated to  
4 attract fish, in order to capture them. More  
5 particularly the composition may be used in the form of  
6 a spray to be applied onto bait, lures or flies which  
7 are used by anglers.  
8

9 Angling and fishing are sport which attract a large  
10 number of people. A wide range of bait, lures and  
11 flies are marketed at these persons in order to provide  
12 them with more success in catching fish.  
13

14 Some organic compounds are known to be active in the  
15 feeding response of some species. They are known to  
16 occur at low concentration levels in shrimps and  
17 related creatures, and also in a range of decomposing  
18 animals. Such compounds are small organic odorants.  
19

20 It has been reported that women have a greater success  
21 rate in catching salmon than male anglers (see *Salmon*  
22 *and women*, W. Paterson & P. Behan, published by H, F &  
23 G Witherby Ltd 1990).  
24

25 It is an object of the invention to provide a

1 composition showing enhanced attracting effects on  
2 fish.

3

4 It is another object of the invention to provide a  
5 method to attract fish by using the composition of the  
6 invention.

7

8 It is a further object of the invention to provide a  
9 spray formulation of the composition of the invention  
10 to be applied to bait (live or dead), lures or flies  
11 (dry or wet) used in the practise of angling.

12

13 It has surprisingly been found that compositions  
14 containing at least one human female pheromone present  
15 an unexpectedly good attractive effect on fish, and  
16 particularly on salmon. Such compositions may be  
17 applied on any kind of bait used by anglers and  
18 fishermen.

19

20 The objects of the invention are achieved with a fish  
21 attracting composition comprising at least one human  
22 female pheromone, or a synthetic nature-similar version  
23 of the latter.

24

25 In one embodiment the invention provides at least one  
26 human together with an acceptable carrier.

27

28 Alternatively the composition can comprise a synthetic  
29 female pheromone with a carrier.

30

31 It is preferred that the pheromone used in the  
32 composition of the invention be at least one volatile  
33 steroid of the androstene family together with at least  
34 one compound chosen from a complex array of alkanolic  
35 acids, including those having a carbon atom number  
36 ranging from C4 to C5 and especially substituted acids

3

1 having a carbon atom number ranging from C8 to C10.

2

3 A preferred composition according to the invention may  
4 comprise in association with nature-similar versions of  
5 human female pheromones, a suite of other potent aroma  
6 chemicals (also called Key Impact Odorants (KIOs))  
7 which occur in both fresh and decomposing animal tissue.

8

9 These other KIOs can be special amines and associated  
10 heterocyclic compounds and some small odorants having a  
11 sulphur osmophore. It is also preferred that the  
12 odorant compounds be provided with concentrations of  
13 several order of magnitude higher than the ones which  
14 are found in conventional bait.

15

16 The composition of the invention is advantageously  
17 formulated as a spray to allow easy manipulation by the  
18 users and could comprise a gas carrier.

19

20 To attract fish one will apply the composition of the  
21 invention on a bait or a suitable support and provide  
22 it in area where fish are used to be found.

23

24 The pheromones which may be advantageously used in a  
25 composition according to the invention include the  
26 following:

27

28 Trimethylamine (TMA) is an exceptionally interesting  
29 KIO pheromone. It occurs on human skin and is  
30 especially important for females. It is the  
31 characteristic odour of a menstruating female. The  
32 odour profile is distinctive and is not shared by  
33 closely related amines such as, for example,  
34 dimethylamine. The aroma is that of fresh shell fish  
35 at the threshold level. In fact it is thought that  
36 most of the charm of oyster, scallops and the like

1 comes from TMA. The aroma changes with increasing  
2 concentration and becomes increasingly unpleasant. At  
3 a high level TMA will be perceived as an off-odour in  
4 shell fish and the like, and as a sign of lack of  
5 hygiene in a human subject.

6  
7 The threshold concentration for humans is about 1ppb (1  
8 part in  $10^9$ ) - this is low by olfactory standards.  
9 There is, in fact, great individual variability and the  
10 concentration varies around the mean figure by about 3  
11 orders of magnitude. This gives rise to great  
12 variability; for example, a lobster or crab may appear  
13 delightful to a person of high threshold but may be  
14 abhorrent to a person of low threshold (skin  
15 sensitivity). See in that matter "Ageing and the Sense  
16 of Smell" C, Van Toller, CH Dodd & A Biling, Charles T  
17 Thomas, Publisher, Springfield, Illinois, USA, 1985.

18  
19 Another interesting pheromone to be used in the fish-  
20 attracting composition is 1-Pyrroline. This is a rare  
21 and little studied human pheromone. It is unstable and  
22 therefore very difficult to study. It is formed by  
23 oxidation of precursor molecules such as 1,4-  
24 diaminobutane and 1,4-diaminopentane. These amines  
25 occur in a variety of human tissues, and can be formed  
26 from appropriate amino acids.

27  
28 In order to overcome the instability problem when 1-  
29 Pyrroline is to be used in a fish-attracting  
30 composition of the invention, the parent amines (i.e.  
31 the above mentioned precursors) are incorporated at an  
32 high level in the composition. They will slowly  
33 oxidize and release the instable active odorant.

34  
35 These parent amines are also called respectively,  
36 putrescine and cadaverine, for obvious olfactory

1 reasons and occurred in decomposing animal tissue. The  
2 human threshold is the ppb range.

3  
4 A further preferred pheromone is the alpha-androsterol.  
5 This pheromone is a well-known pheromone which is found  
6 in both males and females but is thought to be more  
7 important for women (in contrast to the related  
8 steroid pheromone, alpha-androsterone). The threshold  
9 for human is in the low ppb range. The odour is  
10 usually described as musky.

11  
12 A still further preferred pheromone is 4-Methyloctanoic  
13 acid which is characteristic of the scalp odour and may  
14 be found in gamey meat. The threshold is unusually low  
15 for a fatty acid and is in the region of ppb. It is  
16 has been reported that women are much more sensitive to  
17 this odorant than men and this could be because they  
18 have more on their scalps than men do.

19  
20 A particular composition according to the invention has  
21 been tested in fishing experiments on the River Ness,  
22 other rivers in the Highlands and on a variety of  
23 Lochs. Positive results have been obtained.

24  
25 The composition of this particular non-limiting  
26 composition is the following :

27  
28 Component No Name Amount Required for  
29 100 litres of  
30 solvent (ethanol)  
31  
32 1 Trimethylamine 7kg  
33 2 1,4 diaminobutane 7kg  
34 3 1,4 diaminopentane 1kg  
35 4 indole 50 grm  
36 5 skatole 40 grm



6

|   |    |                           |         |
|---|----|---------------------------|---------|
| 1 | 6  | isovaleric acid           | 750 grm |
| 2 | 7  | 4-methyloctanoic acid     | 10 grm  |
| 3 | 8  | 4-methylnonanoic acid     | 5 grm   |
| 4 | 9  | phenylacetic acid         | 20 grm  |
| 5 | 10 | 2-methyl-E-butenic acid   | 5 grm   |
| 6 | 11 | 4-methylpentanoic acid    | 10 grm  |
| 7 | 12 | 2-methyl-2-pentenoic acid | 10 grm  |
| 8 | 13 | alpha-androst-16-en-3-ol  | 5 grm   |

9  
10 Even if a special emphasis has been given on the  
11 utility of the composition in order to ease fishing it  
12 is understood that the composition to attract fish as  
13 above described may be used for other purposes. For  
14 example it may be used to attract salmon into special  
15 paths provided in order to help them to cross dams.

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